IN THE CLAIMS:

1. A process for liquefying starch comprising contacting a thermostable, acid-stable alpha-amylase obtained by culturing *Bacillus acidocaldarius* with an aqueous slurry or solution of the starch having a pH as low as 3.0, the contacting occurring at an elevated temperature and producing a liquefact having a pH of about 4.0 to 4.5 and DE of about 10-12.
2. The process of claim 1 wherein the contacting occurs without adding a calcium salt to the slurry or solution.
3. The process of claim 1 wherein the contacting occurs without adjusting the pH of the slurry or solution of the starch.
4. The process of claim 1 wherein the contacting act is carried out without adding a calcium salt to or adjusting the pH of the slurry or solution of the starch.
5. The process of claim 3 wherein the elevated temperature is from about 90-155° C.
6. The process of claim 3 wherein the contacting act further comprises maintaining the contact at the elevated temperature for about 5-8 minutes.
7. The process of claim 6 wherein the elevated temperature is about 105-110° C.
8. The process of claim 7 wherein the contacting act occurs as a single liquefaction step.
9. The process of claim 8 further comprising providing at least about 150 ASAA units/g of the thermostable, acid-stable alpha-amylase.
10. The process of claim 3 further comprising, prior to the act of contacting, cooking the aqueous slurry or solution of the starch between about 140-155° C for about 5-8 seconds and then reducing the temperature of the cooked slurry or solution to about 90-98° C.
11. The process of claim 10 wherein the contacting occurs between the thermostable, acid-stable alpha-amylase and the cooked slurry or solution at about 90-98° C for about 60-90 minutes.
12. The process of claim 11 wherein the contacting act occurs as a single liquefaction step.

13. The process of claim 12 further comprising providing 1.0 to 10 ASAA units/g of the thermostable, acid-stable alpha-amylase.

14. The process of claim 3 wherein the contacting further comprises first and second contacting acts, the first contacting act occurring at about 105-110° C for 5-8 minutes, and the second contacting act occurring at about 95-98° C .

15. The process of claim 14 further comprising utilizing about 10-35 ASAA units/g of the alpha-amylase in the first contacting act and utilizing about 1-10 ASAA units of the alpha-amylase in the second contacting act.

16. The process of claim 14 wherein the first and second contacting acts occur as two liquefaction steps.

17. A process for liquefying a starch slurry comprising the following acts:

(a) providing a thermostable, acid-stable α-amylase prepared from a *Bacillus acidocaldarius* species;

(b) adding the alpha-amylase to a starch slurry having a pH between about 3.0 – 5.0; and

(c) heating a mixture obtained from step (b) to at least 90° C until a starch liquefact having a pH of about 4.0-4.5 and a DE of about 10-12 DE is obtained.

18. The process of claim 17 wherein acts (b) and (c) occur without adding a calcium salt to the starch slurry.

19. The process of claim 17 wherein acts (b) and (c) occur without adjusting the pH of the starch slurry.

20. The process of claim 17 wherein acts (b) and (c) are carried out without adding a calcium salt to or adjusting the pH of the starch slurry.

21. The process of claim 19 wherein act (c) occurs at about 90-155° C.

22. The process of claim 19 wherein act (c) further comprises heating the mixture for about 5-8 minutes.

23. The process of claim 22 wherein the mixture is heated to about 105-110° C in act (c).

24. The process of claim 23 wherein act (c) occurs as a single liquefaction step.

25. The process of claim 24 wherein act (b) further comprises adding at least about 140 ASAA units/g of the thermostable, acid-stable alpha-amylase to the starch slurry.

26. The process of claim 17 further comprising prior to act (b), the act of cooking the starch slurry between about 140-155° C for about 5-8 seconds and then reducing the temperature of the cooked slurry or solution to about 90-98° C prior to adding the alpha-amylase.

27. The process of claim 26 wherein act (c) further comprises holding the mixture at about 90-98° C for about 60-90 minutes.

28. The process of claim 27 wherein act (c) occurs as a single liquefaction step.

29. The process of claim 28 wherein act (b) further comprises adding 1.0 to 5.0 ASAA units/g of the thermostable, acid-stable alpha-amylase.

30. The process of claim 17 wherein act (c) comprises two heating acts, a first heating act occurring at about 105-110° C for 5-8 minutes, and a second heating act occurring at about 95-98° C .

31. The process of claim 30 wherein act (b) further comprises adding about 10-35 ASAA units/g of the alpha-amylase, and act (c) further comprises adding 1-10 ASAA units of the alpha-amylase in the second heating act.

32. The process of claim 30 wherein the first and second heating acts occur as two liquefaction steps.

33. A single liquefaction step process for starch comprising the following acts:

(a) providing a starch slurry having a pH as low as about 3.0 and a thermostable, acid-stable alpha-amylase obtained from *Bacillus acidocaldarius*;

(b) mixing the alpha-amylase and the starch slurry; and

(c) heating the resulting mixture at at least 90 C until a liquefact having a pH of about 4.0 to 4.5 and a DE of about 10-12 DE is obtained.

34. The process of claim 33 wherein acts (b) and (c) occur without adding a calcium salt to the starch slurry.

35. The process of claim 33 wherein acts (b) and (c) occur without adjusting the pH of the starch slurry.

36. The process of claim 33 wherein acts (b) and (c) are carried out without adding a calcium salt to or adjusting the pH of the starch slurry.

37. The process of claim 33 wherein act (c) occurs at about 90-155° C.

38. The process of claim 33 wherein act (c) further comprises heating the mixture for about 5-8 minutes.

39. The process of claim 38 wherein the mixture is heated to about 105-110° C in act (c).

40. The process of claim 39 wherein act (b) further comprises adding at least about 140 ASAA units/g of the thermostable, acid-stable alpha-amylase to the starch slurry.

41. The process of claim 33 further comprising prior to act (b), the act of cooking the starch slurry between about 140-155° C for about 5-8 seconds and then reducing the temperature of the cooked slurry or solution to about 90-98° C prior to adding the alpha-amylase.

42. The process of claim 41 wherein act (c) further comprises holding the mixture at about 90-98° C for about 60-90 minutes.

43. A starch liquefaction method comprising the acts of:

(a) providing a starch slurry having a pH as low as 3.0 and an thermostable, acid-stable alpha-amylase capable of hydrolyzing starch at a pH as low as 3.0, the alpha-amylase cultured from *Bacillus acidocaldarius*;

(b) mixing the starch slurry and about 150 ASAA units/g of the alpha-amylase without adjusting the pH of the starch slurry; and

(c) jet cooking the mixture resulting from step (b) for about 5-8 minutes at about 105-110° C to obtain a liquefact having a DE of approximately 10-12.

44. A starch liquefaction method comprising the acts of:

(a) providing a starch slurry having a pH as low as 3.0 and an thermostable, acid-stable alpha-amylase capable of hydrolyzing starch at a pH as low as 3.0, the alpha-amylase cultured from *Bacillus acidocaldarius*;

(b) jet cooking the starch slurry between about 140-155° C for about 5-8 seconds without adjusting the pH of the starch slurry;

(c) lowering the temperature of the cooked slurry from step (b) to about 95-98 C° and adding about 1.0 to 5.0 ASAA units/g ds of the alpha-amylase; and

(d) allowing the mixture of step c) to undergo hydrolysis for about 60-90 minutes to produce a liquefact having a DE of about 10-12.

45. A starch liquefaction method comprising the acts of:

(a) providing a starch slurry having a pH as low as 3.0 and an thermostable, acid-stable alpha-amylase capable of hydrolyzing starch at a pH as low as 3.0, the alpha-amylase cultured from *Bacillus acidocaldarius*;

(b) mixing the starch slurry with about 10-30 ASAA units/g ds of the alpha-amylase without adjusting the pH of the starch slurry;

(c) jet cooking the mixture resulting from step (b) for about 5 minutes;

(d) adding about 1-5 ASAA units/g ds of the alpha-amylase to the jet cooked mixture from step (c); and

(e) continuing liquefaction at about 95-98 ° C for as little at 30-90 minutes to obtain a liquefact having a DE of approximately 10-12.

46. A starch liquefact made by the process of claim 3, the liquefact free of maltulose and suitable for saccharification without inactivation of the thermostable, acid-stable alpha-amylase and/or without adjustment of the about 4.0-4.5 pH of the liquefact.

47. A starch liquefact made by the process of claim 17, the liquefact free of maltulose and suitable for saccharification without inactivation of the thermostable, acid-stable alpha-amylase and/or without adjustment of the about 4.0-4.5 pH of the liquefact.

48. A starch liquefact made by the process of claim 33, the liquefact free of maltulose and suitable for saccharification without inactivation of the thermostable, acid-stable alpha-amylase and/or without adjustment of the about 4.0-4.5 pH of the liquefact.

49. A starch liquefact made by the process of claim 43, the liquefact free of maltulose and suitable for saccharification without inactivation of the

thermostable, acid-stable alpha-amylase and/or without adjustment of the about 4.0-4.5 pH of the liquefact.

50. A starch liquefact made by the process of claim 44, the liquefact free of maltulose and suitable for saccharification following thermal inactivation of the liquefact and without an adjustment of the about 4.0-4.5 pH of the thermally inactivated liquefact.

51. A starch liquefact made by the process of claim 45, the liquefact free of maltulose and suitable for saccharification following thermal inactivation of the liquefact and without an adjustment of the about 4.0-4.5 pH of the thermally inactivated liquefact.

52. A starch liquefact prepared by the process of:

a) mixing a starch slurry having a pH as low as 3.0 with a thermostable, acid-stable alpha-amylase derived from *Bacillus caldarius*; and

b) heating the mixture from act a) to at least 90° C until a DE of approximately 10-12 is obtained.